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Motion Detection In Real-Time Video Surveillance With Movement Frame Capture And Auto Record

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Abstract- Traditional video surveillance takes a huge amount of storage space. Recording everything captured by a surveillance camera consumes the large storage space and hence limits the duration of video that can be stored. In addition, recording everything makes it time-consuming for a human to review the stored video. All these disadvantages limit the effectiveness of traditional video surveillance. To solve these problems recording only captured images that contains import this project uses a robust motion detection algorithm for real-time motion detection by considering and information, i.e., image that contains motion in the scene. This can be done with a web camera and a motion detection algorithm that detects motion. Once the motion detection algorithm robustly distinguishes motion from lighting changes. Web camera can take the snapshot of the moving object and at the same time, it will activate the warning system before storing the frames on the memory.

Keywords- Video Surveillance, Real-time Motion Detection, Web Camera.

I. INTRODUCTION

Moving Objects Detection and Image Compression are widely used low-level tasks in many computer vision applications, like surveillance, monitoring, robot technology, object recognition etc. Many approaches have been proposed for moving object detection and image compression from videos, mainly dedicated to human monitoring and visual surveillance.

Although the exact requirements vary between surveillance systems, there are issues that are common to all. Usually, an operator is interested only to detect certain objects in the scene. For example, in surveillance of a public area, one may be interested only to monitor the people within the scene rather than the entire scene in the area.

In general motion detection methods are classified broadly into three main categories: Background Subtraction, Temporal Differencing and flow based. Our approach is background subtraction. Detection of moving objects in video streams is the first stage in any video surveillance system. Aside from the intrinsic usefulness of being able to segment video streams into foreground and background components, detecting moving objects provides a focus of attention for activity analysis, making these later processes more efficient since only "foreground" pixels need be considered.

Nowadays, the size of storage media increases day by day. Although the largest capacity of hard disk is about 2 Terabytes , it is not enough large if we store the video file without compressing it. Image Compression aims to describe the process of storing the image with less number of bytes in digital memory by removing the redundancy from the image. Digital Images are stored with BMP,TIFF, GIF, JPEG formats.

Some of the relevant works in the field of motion detection and image compression is mentioned in the following section. This paper is organized as follows. Section 2 describes the related methods available. Section 3 briefly describes the proposed methodology. Section 4 deals with the experimental results. Section 5 includes the conclusion and future enhancement.

II. RELEVANT WORK

We survey the techniques and method relevant to motion detection, specifically approaches that detect the

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moving object. For accurate detection, the motion must be accurately detected using suitable methods, but they are affected by a number of practical problems such as shadow and lighting change over time.

Many researchers have given their contributions to Motion based object detection under indoor scenes and provide solutions to the above mentioned problems.

Asif Ansari et al. [2] proposed a motion detection system which provides an efficient method for surveillance purposes and provide the user a facility to use an audio file as alarm signal. In [3], motion detection and object tracking method which is simple and direct with which the changing part in video can be quickly detected K.Amaleswarao et al. [4] proposed a temporal differencing to detect the moving object and give the alarming in time and produces high accuracy. This method is a fast and achieve better detection performance.

Motion Detection and Object Tracking [5] is a popular technique which is robust against the complex, deformed and changeable shape. This method is scale and rotation invariant, as well as faster in terms of processing time. In [6], temporal differencing approach which is robust statistical activity recognition used for modelling activities.

G.L.Foresti et al. [7] proposed a motion segmentation method to detect with high accuracy the motion inside the monitored scene. In [8], motion detection approach will reduce the unwanted recording of surveillance videos. This method consumes low power. . In [9] background subtraction technique are used to detect the moving object and then remove the shadow in subsequent phase.

Kauleshwar Prasad et al. [10] proposed a motion detection method which provides a less noise. This method scan from top to bottom for detecting the presence of an object. Lucia Maddalena et al. [11] proposed a background modelling which makes the neural network structure much simpler. This method is able to detect foreground objects against new backgrounds.

In [12], change detection method are used to analyze temporal information between successive frames to obtain the change region. This method is low computational load and system complexity. In [13] Pranab kumar dhar et al, employ motion detection based approach to detect object more accurately from input image and has manual threshold selection. Shin-Min Chao et al. [14] proposed a background subtraction method that can effectively extract motion objects and is less sensitive to illumination change.

III. OVERVIEW OF THE PROPOSED WORK

The overview of the given model is as follows:

- Capturing the live video feed into the webcam is the first step in video surveillance. It is not possible to process the video directly. So video sequence is composed of series of frames.
- Analyzing images, we can compare the current frame captured with previous frame to detect the motion.
- Activity Behavior of the human is analyzed in the background modeling module. If the abnormal behavior is found in the scene, the system automatically take the snapshot of the detected image and executes the alarm according to the user settings.
- Video encoder can improve the efficiency of compression algorithm and reduce the transmission rate. The video is compressed by JPEG lossless compression method.
- The compressed video is stored in the system memory as JPEG file.

The proposed model is depicted in figure 1. The video processing techniques that are used in the proposed system has been explained in the following sections.

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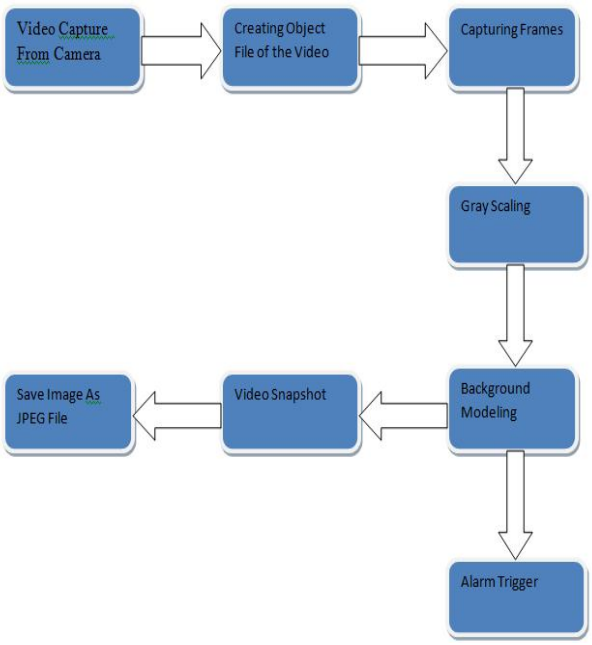

Fig. 1. Block diagram of system

IV. VIDEO PROCESSING TECHNIQUES

A. *Pre-Processing*

First, the videos are separated as frames and pre-processing is mainly used to enhance the contrast of the image, removal of noise and for color conversion. The aim of pre-processing is an improvement of the image data that suppresses unwanted distortions or enhances some image features important for further processing. Four categories of pre-processing techniques are pixel brightness transformations, Geometric transformation, Local neighborhood of the processed pixel, Image restoration. In our paper, pixel brightness transformation will be used for change brightness without regard to position in the image.

B. *Background Modeling*

Identifying moving objects from a video sequence is a fundamental and critical task in many computer vision application. There are three conventional approaches to moving object detection are temporal differencing, optical flow and background modeling methods. From the above three human detection methods, background modeling method is used in our system. The image is expected to contain some noises. Noise should be handled before the subtracted image is sent for further processing. As observed in [1], automatic moving object detection algorithm is suited to our model. Automatic moving object detection algorithm is based on absolute difference and region combination. Moving regions were obtained automatically by frame difference with an effective threshold selection algorithm. Absolute difference is computed by comparing the current frame captured with previous frame from the video sequence. The proposed algorithm is automatic and efficient in moving object detection for video surveillance application.

C. *Alarm Trigger*

Alarm trigger module is the core of the video surveillance system, which mainly include the object identification and provide the signal to the user by triggering the alarm.

D. *Video Compression*

The video is compressed by JPEG coding. The quantization parameter value and extent of data loss are associated with the picture quality. The area containing moving object is the important information, so lossless compression is used. The compressed video frames should be stored as images in JPEG file.

V. CONCLUSION

Various existing motion detection algorithms available to video surveillance systems are studied. But in most of the algorithm that does not completely detect the moving object because it causes some shadow and it requires large memory to store the video. The studies proved that the initial object mask problem are responsible for shadow present in the detecting moving object it will lead to degrade the accuracy of the system whereas the noisy region is dominant part of accuracy degradation. In our proposed scheme therefore, a best motion detection algorithm must be made for detecting the moving object without present of shadow, particularly for banking applications to improve the security. Furthermore, include an option to take snaps periodically, manually or automatically to store the

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image with less number of bytes. In future, it will implement in real time system.

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